

The Sun.

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The Last Session of the Fifty-fifth Congress.

Congress will meet two weeks from today. Between that date and the fixed date of adjournment, on March 4, there are only thirteen weeks for the legislative work of the session.

Besides the regular appropriation bills, some of which will require more than the ordinary time and labor on account of the expenditures made necessary by the war with Spain, there will be some other questions arising from the war which will demand attention.

Not among these questions marked "urgent" by common sense and patriotism is that of the system of government to be instituted in our new territory.

Philosophical statesmanship will be bulging and bursting with ideas on this subject when the Senate and the House assemble. Recent events have thrust upon Congress a task comparable in magnitude only with that of reconstruction after the civil war. But this task, fortunately, has not to be performed within the next fifteen weeks. It need not even be begun within that period. It need not distract the attention of the Fifty-fifth Congress from more immediate duties which will fully occupy the remaining weeks of its existence.

A premature discussion of schemes of territorial government in Porto Rico and in the Philippines, or of methods to be pursued in the administration of Cuban affairs, will surely do more harm than good. Those great questions should be approached only after the conditions of the problems have been ascertained by deliberate and thorough investigation.

Meanwhile, military government will meet all requirements in all of the islands.

Aladdin and Gamaliel.

The gigantic movement which has begun in Massachusetts will soon be thundering westward, sounding to this town its terrible approach.

The \$100 raised by the Massachusetts Reform Club in a moment of excitement has not stayed the wave of imperialism. So a movement has been ordered. The Hon. ALADDIN ATKINSON has a plan for canvassing the country in the next two weeks and getting signatures to petitions asking the President "to turn from his present policy." Mr. ATKINSON, as we have already remarked, is persuaded that "the mass of the people are not in favor of annexation," and he expects to prove that part by a tempest of signatures within two weeks. Rather a short time for polling the country, but the Hon. ALADDIN ATKINSON is an active fellow. It will require great firmness on Mr. MCKINLEY's part to refrain from turning when Mr. ATKINSON says "turn."

We learn from the Boston correspondent of the *Springfield Republican*, which continues to revolve rapidly on what would be its head, if it had any, that "it is expected to secure the cooperation of prominent men in every section." In the New England section the cooperation of prominent men has been obtained already. The Hon. ALADDIN ATKINSON is not only prominent but protuberant, and, side by side with him, commanding these with most sterner uprightness, stands our preter-probient old friend with the stupendous name, the Hon. GAMALIEL BRADFORD.

Still, on the whole it will be prudent for the Massachusetts Reform Club to put up another hundred.

France's Tremendous Fiscal Burdens.

Although the Czar's proposal for a partial disarmament has not been received favorably in Paris, there is no European power which is more vitally interested than is the French Republic in lessening the strain imposed upon its resources by a huge military establishment. That is the conclusion to be drawn from the interesting statistics compiled by Mr. W. R. LAWSON for the current number of the *National Review*. Mr. LAWSON shows that taxation in France is already screwed up almost to the highest point of endurance possible in times of peace, and that the would, therefore, find it extremely difficult to meet the extraordinary exigencies which would arise in case of war with one of the great powers.

Few persons realize the extent of the financial burdens which have been laid on France during the last quarter of a century. The last contest with Germany, although it lasted but nine months, cost France more than did all the wars of the First Republic and First Empire, notwithstanding that these stretched over a period of twenty years. On the 1st of April, 1814, the sum total of the outstanding public debt represented a capital value of \$252,800,000. On the other hand, the new loans issued in 1871 alone reached the aggregate of \$265,000,000. During the sixteen years since that date, the would, therefore, find it extremely difficult to meet the extraordinary exigencies which would arise in case of war with one of the great powers.

Very different was the experience of the Second Empire. What with internal extravagance and the cost of the Crimean, Italian and Mexican wars, the public debt which was left behind by Napoleon III. did not fall far short of \$2,500,000,000. The outlay caused by the last German war, and the Commune added about 50 per cent. to the debt inherited from the Second Empire. On Jan. 1, 1876, the amount of the outstanding *rentes* had a capital value of nearly \$4,000,000,000. This, moreover, was only the funded portion of the debt, the annual interest charge on which was less than \$150,000,000. More than \$80,000,000, in addition, was required for interest on floating debt, terminable annuities, pensions, etc. In the budget for 1898 the sum appropriated "for the service of the debt" is upward of \$250,000,000, of which the interest on the funded debt absorbs but little more than

one-half. The annual provision for the various categories of the public debt now requires 36 1/2 per cent. of the revenue, and calls for \$6.60 a year from every man, woman and child in the republic.

When we say that, in France, the national revenue now reaches \$700,000,000, we give by no means a complete idea of the burden that rests upon the taxpayers. Local taxation amounts to at least half as much. The Communes, of which there are some thirty-three thousand, absorb fully \$200,000,000 a year; the greatest of them, Paris, is exacting from its inhabitants \$70,900,000 in the current twelve months. Then, again, there are the eighty-seven Departments, which, together, levy an income of \$65,000,000, nearly equal to that of the city of Paris. We have thus a total for the national and local taxation of \$965,000,000; even if we deduct Post Office and telegraph receipts, State domain and other non-fiscal revenues, we have still a balance of nearly \$900,000,000.

What proportion does the sum thus extracted by taxation bear to the whole national income? M. DE FOVILLE, who is one of the most eminent French authorities on finance, has calculated in *La France Economique* that the country's income, including all the earnings of French industry, commerce and finance and all the interest on invested capital, is somewhere between four and five hundred dollars. If that figure be correct, it follows that almost 50 per cent. of the national income is appropriated by the State. M. LEROY-BEAULIEU assumes that the total income of the nation is somewhat larger, for he arrives at the conclusion, after a careful investigation, that the average rate of taxation in France represents about 15 per cent. of it. This is a proportion so near the danger limit that French statesmen have of late recognized their inability to keep pace with Germany in military expenditures. In 1877 the French Army had \$108,000,000 spent on it; in the same year the German Army cost less than \$94,000,000. In 1898, on the other hand, the estimates for the German Army amount to nearly \$153,000,000, whereas France is able to lay out less than \$120,000,000 on her military establishment.

It follows that in comparison with Germany, France is growing weaker every year in respect of military efficiency. It may be said that, oppressive as these fiscal burdens seem, France has borne them for years, and may have become used to them. Where, however, would she get the vast additional sums which would be needed for the prosecution of a war against one of the great powers? Such a contest would have to be financed, as was that of 1870, mainly by borrowing on a gigantic scale. But France would now enter the loan market on a very different footing. The starting point in 1871 was an existing debt of two and a half billion dollars. Now the existing debt is more than twice as large. Moreover, the revenue is not so great as it once was, the limit of taxation is nearly reached. It is extremely doubtful, therefore, whether it would now be possible to repeat the brilliant loan operations by means of which the German indemnity was paid and French soil was emancipated. Undoubtedly the day is past when France could lightly enter on a policy of adventure. M. DE FOVILLE, to whom we have referred, has warned his countrymen that, while France may be rich enough to pay for her past glories and her recent reverses, she can no longer afford the phantasies to which she is allured by the generosity of some and the ambition of others; by greed here and passion there.

The War and the Auxiliary Fleet.

For the first time since its formation the Society of Naval Architects and Marine Engineers has had a war of our own to discuss, and this fact palpably dominated its annual meeting recently held. Some papers read there were founded on war experiences, and others drew illustrations from that source; there were topical discussions of questions regarding the working of engines and boilers during the war, and much of the information brought out was practical. The two lines of professional work pursued by the members were blended happily by Mr. GIBSON, the President, who developed in his opening address Sir N. BARNARDY's assertion that "no nation can maintain an efficient navy without a prosperous commercial marine to support it." For navy and army uses, he said, our Government bought or chartered this year about two hundred vessels of all sorts, from tugs to transatlantic liners, and the rapidity and effectiveness with which they were fitted out for war service was hardly less creditable to our shipbuilders than the designing and constructing of the navy vessels that achieved a world-wide fame.

The paper of Mr. W. P. STEPHENS on the steam yacht as a naval auxiliary in the war with Spain dealt with this same subject in detail. We used ocean-going tugs and steam yachts as tenders to the blockading fleet in the West Indies, for general work in the shoal harbors and rivers, there for picket duty offshore on our own coast, especially when there was fear of a Spanish fleet, and for harbor patrol duty to guard mine fields from garbage scows or coasting schooners, and to enforce port regulations of all sorts. Twenty-seven steam yachts were procured, and while some were unsatisfactory or downright failures in sea work, others performed splendid service. The Gloucester and Vixen at Santiago became famous, but Mr. STEPHENS points out that the Mayflower, Scorpion and others did good work, though under circumstances attracting less attention.

Of course the practical question now is as to how the Government may get still better use of the yacht fleet in another war. Many of the yachts it bought last summer were not planned for sea service, and could not carry the desired guns and ammunition, or coal, or supply enough berthing space for the crews. They were without protection, generally had inadequate water tanks and no distilling apparatus, and their decks were not meant to withstand the shock of firing guns. Some even could not compensate for these defects by lightness of draught. Capt. MILLER, during the discussion of the subject, held that some of the yachts were very costly, and some could not make continuous speed enough, day in and day out. Still, Mr. STEPHENS does not have much faith in subsidizing yachts on condition of their being built with a view to conversion into war vessels, because the ordinary pleasure yachts conflict with the war needs, and must control the owner's plans. He suggests that the Government could provide its own small craft for despatch, tender, picket, and harbor patrol service, with the speed and draught just right. Nevertheless, it will do well also to keep an eye on the yacht interests, for "while nothing can be done in the way of direct financial aid, it is a wise and sound policy to encourage yachting by the removal of all unnecessary and oppressive regulations." The owners,

on their part, though they may not be willing to hamper speed and luxurious appointments for the sake of possible use in war, perhaps hereafter will not disregard wholly this latter possibility, with its chances of selling the vessel to the Government at a price somewhat determined by its suitability for war purposes.

It seems clear that the war has benefited American shipbuilding. To begin with, the Government's purchase of many liners and other vessels made vacancies which, in some cases at least, will be supplied by adding new vessels, the ready money being available for that purpose. Next, our new possessions in the Antilles and the Philippines will stimulate trade, and that will call for more ships. Finally, there are now more war vessels, taking all classes together, under construction for the Government—over fifty in all—than ever before, Congress making liberal provisions for them at the last session. Hope, too, for the shipbuilding industry has been revived by orders for war vessels from Japan and Russia, while Mr. GIBSON noted that this year ship steel has been exported to Great Britain on its merits as to quality and cost.

Introducing Goose Island Noonan.

Many radiant figures were put out by the fall elections, and it seemed for a time as if the next Congress would be black with irrecoverable eclipse. JERRY SIMPSON has fallen a victim to the fell conspiracy of the Money Changers. WIND ALLEN will blow no more. The Capitol will not bloom during the Fifty-sixth Congress with the pink follies of HAM LEWIS. Even the reticent BILL STEWART is threatened. Was genius to be banished from Washington? Were no romantic shapes to illumine the details of public business? Fortunately the supply of greatness is a constant quantity and specimens never fail. Chicago has already filed a caveat on the Democratic statesman who is to represent the Fifth Illinois Congressional district. His name is the Hon. GOOSE ISLAND NOONAN and his specialty is universal genius. We judge from the appreciative biography of him, compiled by the *Chicago Times-Herald*, that he has the courtier's, soldier's, scholar's eye, tongue, sword, and that in point of various accomplishments LEONARDO DA VINCI was a beginner, compared with him. Take a short tour in this continent of excellence.

The Hon. GOOSE ISLAND NOONAN is "37 years old, dark as a Spaniard, but good looking, nevertheless, a bachelor, one of the heaviest taxpayers on the great west side, a successful attorney and other things too numerous to mention," except in the Congressional Directory. He played football at the University of Michigan. He won a medal at boxing. He was captain of his college athletic team. He has been the champion billiard player of the Illinois Club. He is a skilled fencer. He "keeps a fine saddle horse, and when he rides forth on the boulevard he is strictly up to date in every detail." At this point public curiosity yells to be appeased. We have great pleasure in exhibiting a portrait of the Hon. GOOSE ISLAND NOONAN in his ordinary boulevard costume, up to date in every detail:



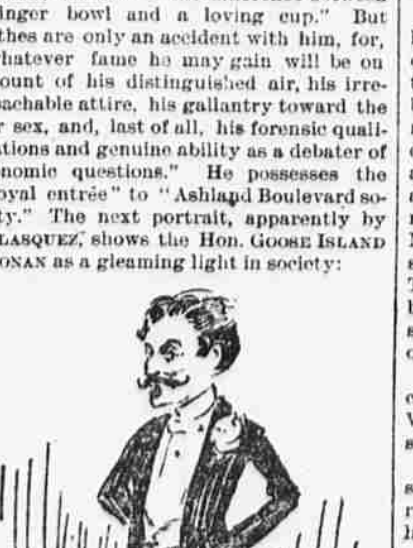
Harvard Wakes Up.

There has been such a monotony of ill luck about Harvard's athletic efforts, outside of the gentler sports, for some years that her victory at football over Yale, following her victory over Pennsylvania, will attract no envy. Even the Cambridge freshmen, immemorably an unfortunate year, have walloped the Yale freshmen this year:

"FI OZ, BUTTE!"

Yale has an almost uninterrupted tradition of success as against Harvard at football, and, for one reason or another, she has had the better system of training and developing her players. She possesses a large body of experts who are able to give a considerable part of their time to the education of her teams. There is or has been a solidarity of aim and effort and an intensity of college patriotism among her undergraduates which the North has.

But we must tear ourselves away from the fascinating scene. The humble cataloger should not aspire to be the critic. The Hon. GOOSE ISLAND NOONAN has been a Colonel and Governor of college regiments. A picture of him in his braids and buttons must be bright enough to bring real water into the eyes of the Chicago River. Possibly there is such a work in his "collection of paintings, embracing many examples of the old masters." He also has the second-best collection of "Napoleon portraits" in Chicago and "a library of some 2,000 volumes in which are hundreds of rare first editions." He "wears tailor-made garments; is somewhat fastidious in his selection of gloves and cravats; and knows the difference between a finger bowl and a loving cup." But clothes are only an accident with him, for, "whatever fame he may gain will be on account of his distinguished air, his irreproachable attire, his gallantry toward the fair sex, and, last of all, his forcible qualifications and genuine ability as a debater on economic questions." He possesses the "royal entrée" to "Ashland Boulevard society." The next portrait, apparently by VELASQUEZ, shows the Hon. GOOSE ISLAND NOONAN as a gleaming light in society:



An alleged interview with Mr. ANDREW CARNEGIE, printed in a newspaper whose name is by no means a warranty of authenticity, represents him as saying: "I begin to grow doubtful about the President having convictions upon any subject." The Boston Herald likewise undertakes to discuss Mr. MCKINLEY's mental characteristics. It remarks concerning him: "Wherever it has been possible he has been neutral and colorless, allowing his actions to be the impression of the stronger of the various party influences with which he has been brought into contact." At times his disposition to be self-assertive has been productive of serious dissatisfaction among those of his party who wish to have their Chief Magistrate adopt a bold and aggressive policy."

The white spots with which the idol of Ashland Boulevard adorns his pumps are perhaps not the least remarkable part of an unforgettable masterpiece. The biog-

rapher adds this graceful summary of the Hon. GOOSE ISLAND NOONAN's social charms: "With all these accomplishments at his command, Congressman NOONAN has wealth enough to make him a desirable catch for the ambitious mamma at Washington. He owns enough acre property in Chicago to offer a site for a good-sized city. He is not averse to society, either as nearly everybody a society to which he has attended the charity balls and the grand opera. At these functions Col. NOONAN shines with no borrowed light. He is one of the observed throughout the evening, and he is not afraid of the public gaze."

Surely such a man must feel that he is giving the public gaze something worth looking at. We are not surprised to learn that the only man who ever had the heart to beat the Hon. GOOSE ISLAND NOONAN as a candidate for public office was a blind man.

Chicago's Big Ditch.

Since July, 1892, the city of Chicago, or, rather, the Drainage district embracing Chicago and forty-three square miles of adjoining territory, has been engaged in cutting from Lake Michigan to the head of the Des Plaines River a great canal, 40 miles long, 200 feet wide and 22 feet deep, through which the water of the lake will run to the Mississippi, and carry with it not only vessels, but the sewage of Chicago, which now empties into the Chicago River, spreads out into Lake Michigan, and pollutes the water which the city draws from the lake for domestic purposes. The task, it is expected, will be completed, or nearly so, during 1899, and the total expenditure on it will be over \$30,000,000.

Upon the usefulness of the scheme to Chicago it is unnecessary to descant. It will furnish to the city a means of water communication with the whole immense Mississippi Valley, relieve it from the nuisance of a great and increasing volume of sewage, and protect its water supply from the pollution which at present imperils the health of its inhabitants. Now, just as the work, to which so much labor and money has been devoted, approaches its completion, opposition to it has sprung up and threatens to embarrass, if not to prevent, its further prosecution.

This opposition proceeds from two quarters. The cities situated upon the chain of great lakes, of which Lake Michigan is the head, fear that the diversion of water into the canal from Lake Michigan will lower the level of the water in their harbors, as to prevent the access to them of deep draught vessels, while the people of Illinois, through which the canal will run, and of St. Louis, which will be near its outlet, declare that it will contaminate their water supply and be detrimental to their health. Engineers, however, say that the water will be not more than four inches, which is less than that often due to the effect of gales of wind, and sanitarians contend that the canal water, though polluted as it leaves Chicago, will purify itself as it flows on, and long before it reaches St. Louis will cease to be injurious. Nevertheless, Congress is to be asked to interfere and to take measures for preventing the apprehended mischief.

It is hardly likely that the completion of the canal, merely as a waterway, will be forbidden by legislation. Should it have the effect of lowering seriously the level of the lakes which it drains, that evil could be remedied by the use of locks or gates. Should it be found to do the mischief to health apprehended from making it a great trunk sewer for Chicago, a remedy can be found for that also. For instance, the sewage could be first carried into a reservoir, and the impurities in it allowed to settle before it enters the canal. Other devices will no doubt be contrived if necessity arises for them, and thus the canal will not need to be utterly abandoned.

For a long time past that has seemed to me the most radical policy for the Southern whites. More than any other part of the United States interests dictate their affiliation with the conservation of the country, or, to put it plainly, with the Republican party. If they cease opposing the political sentiment of the negroes merely because it is the negro sentiment, and in giving their support to the Democratic party in the South, they are simply because it is not the party of the negroes, will not the colored people follow them as their natural leaders in a direction whither they themselves would go? As it is now, race discord is exacerbated by political discord, and presently the two lines of the Democratic party, the one Southern and the other Northern, are made inseparable by the color line. The race soreness, therefore, is constantly irritated. It may be said that in speaking thus I exhibit partisan bigotry and show cynicism in paying no heed to the obligation of political principle and conviction which makes the Southern Democrats, but actually there is no such compelling motive. The issues which distinguished men as Democrats have passed away. The tariff question has gone as a cause of party division; the South of to-day is no more free trade than the North; it is becoming a great manufacturing section. Not a single issue belonging to the Democratic party remains. Except for the solid South, there would be no hope for the Democratic party; yet the South, as the South, has no more reason for being solidly Democratic than has the West, and, except for the color line, Southern whites have no motive for clinging to the Democratic party. The only reason for their opposition to the Republican party is merely because it is Republican, or the same motive which, as you have said, inspires the Democracy of the city of New York. Take away the Tammany Democracy and the Southern Democrats, and what would be left of the party? Actually the Republican party in its great and general policies expresses Southern sentiment more truly than the Democracy. Yet Southerners cling to Democracy, and even the old Whites of the political period prior to the Civil War have gone over to it. To sum it all up, the salvation of the South, social, political and material, requires its abandonment of false Democracy and its affiliation with the conservative sentiment of the country by the cordial acceptance of the Republican party, by means of which the dangers of its color line will be overcome and destroyed. The whites there have in their power to harmonize race difficulties and to preserve the advantages they enjoy over the North in their cheap negro labor and their immunity from Southern taxation, and what would be left of the negroes respect and admire the Southern whites, and apart from discord caused by the diversity the two races get on together better than at the North. The color line, then, has advantages at the South which the white competition in labor denies him at the North. The climate suits him better and happier there. Why, then, are there any colored people in the North? Simply to worship the old faith of Democracy.

Many doctors, learned and unlearned, have given their diagnosis of the confusion of method that has seemed to characterize the processes of athletic training at Cambridge, but the general truth of the matter may be stated thus: Yale has had no machine and Harvard hasn't had any machine at all. This year Harvard has a machine, and the fumbling and fussy Mugwumpian method has been given up. The Hon. JACK MCMASTERS, formerly of Princeton, is a successful boss in the physical training line. The Hon. CAMERON FORBES is a successful boss in the scientific football line. The results have been unity of effort and precision of discipline, and victory.

Yale needs no encouragement. She will come up to the scratch smiling next year. We hope that on the water as on the land she may find in Harvard an equal.

Speaking of football, it seems to be in a state of especially high cultivation in the region where JONATHAN EDWARDS planted his iron heel.

experience. Do they regard the Hon. WILLIAM MCKINLEY as a man without convictions, neutral and colorless, and unable to form a fixed purpose and to carry it out?

Suppose that the Senate and House of the Fifty-fifth Congress omit this year the formal adjournment for the holidays, for a fortnight after assembling for work. Try the experiment as a war measure.

Prof. JOHN BRISHER WALKER of the Type-written University is infringing a patent in calling himself the "new Democratic party." The new Democracy dates from 1893. Prof. WALKER is newer or newer, and yet he is the same old WALKER, a pure and perpetual fountain of joy.

Measure learned Germans are going to measure the earth. The Emperor WILLIAM has agreed to take it if the measurements are satisfactory.

According to our Florida contemporary, the Columbia County citizen, there was a remarkable Democratic success "way down upon the coast" in the election of a United States Senator. "Bathing himself in the waves of patriotism, the Democracy of old Columbia came gallantly to the front on last Tuesday and elected their sons by a handsome majority."

The more the Democracy of old Columbia review themselves, the more she will be astonished at their both and front.

Wait a year until the smoke of this battle clears away. The people will cry out to be saved.

And JERRY is ready to engage in the people-saving business again. Meanwhile he contents himself with branding 101 on his steers at Plutocrat Ranch, near Medicine Lodge.

THE SITUATION IN THE SOUTH.

The Whites Can Control the Negroes Easily If They Are Wise.

TO THE EDITOR OF THE SUN:—It is distressing to read of sanguinary race conflicts in States of the South a generation after the emancipation and enfranchisement of the negroes; but the alarm I hear expressed lest trouble of that sort should spread extensively and dangerously in the early future is not justified. On the whole, the great social and political revolution at the South caused by the destruction of slavery has proceeded and is proceeding more satisfactorily than could have been expected. The violent encounters between the white and the negro are sporadic only and give no indication of a general uprising on either side. At the meeting of the colored people at Cooper Union the other evening, I was glad to find that, though some vengeful feeling because of the occurrences in North Carolina and South Carolina was expressed, it was not encouraged by the directors of the meeting.

It seems to me, after a somewhat careful and extensive examination of the conditions at the South, that the whites have no reason to fear their ability to dominate those States politically without bitter conflict with the blacks, and that the balance of their judgment, as to the natural, the inevitable leaders, and they will be followed as such by the negroes, as ignorance generally follows enlightenment, if they exhibit political sagacity.

The trouble in the South is due largely to the fact that the whites are politically uneducated, and blacks are separated sharply on race and color lines. Naturally the negroes are Republicans, and the whites persist in supporting the Democratic party, no matter what may be its policy. The Populists went over to the Democrats in 1896, and last election proves that they are remaining there. This is an abnormal political situation, and it is provocative of conflict with the negroes. A "solid South," that is, a solid Democratic South, is an evil no less for itself than for the whole Union. It means that the politics of this section is made solely by the race question, that the whites and blacks are arrayed solidly against each other in political partnership; and the consequence must be bad all around. The political conflict and the race conflict are made one and indistinguishable. Free silver, Bryanism, and the "white supremacy" are made inseparable, and thus the sympathy of the conservative North is rebuffed by the whites, and the South is looked upon as a political center that imperils the prosperity of the country.

For a long time past that has seemed to me the most radical policy for the Southern whites. More than any other part of the United States interests dictate their affiliation with the conservation of the country, or, to put it plainly, with the Republican party. If they cease opposing the political sentiment of the negroes merely because it is the negro sentiment, and in giving their support to the Democratic party in the South, they are simply because it is not the party of the negroes, will not the colored people follow them as their natural leaders in a direction whither they themselves would go? As it is now, race discord is exacerbated by political discord, and presently the two lines of the Democratic party, the one Southern and the other Northern, are made inseparable by the color line. The race soreness, therefore, is constantly irritated.

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TESLA AND HIS WORK.

His Efforts in Various Fields of Investigation Described by Himself.

TO THE EDITOR OF THE SUN:—Sir: Had it not been for the urgent duties, I would before this have acknowledged your highly appreciative editorial of Nov. 13. Such earnest comments and the frequent evidences of the highest appreciation of my labors by men who are the recognized leaders of this day in scientific speculation, discovery and invention are a powerful stimulus, and I am thankful for them. There is nothing that gives me so much strength and courage as the feeling that those who are competent to judge have faith in me.

Permit me on this occasion to make a few statements which will define my position in the various fields of investigation you have touched upon.

I cannot but gratefully acknowledge my indebtedness to earlier workers, as Dr. Hertz and Dr. Lodge, in my efforts to produce a practical and economical lighting system. The first of these, first disclosed in a lecture at Columbia College in 1891. There exists a popular error in regard to this light, inasmuch as it is believed that it can be obtained without generation of heat. The enthusiasm of Dr. Lodge is probably responsible for this error, which I have pointed out clearly by showing the impossibility of reaching a high vibration without going through the lower or fundamental tones. On purely theoretical grounds such a result is thinkable, but it would imply a device for starting the vibrations of unattainable qualities, inasmuch as it would have to be energized by heat, and other properties of matter. Though I have convictions in this regard, I disavow for the present this proposition as being impossible. We cannot produce light without heat, but we can surely produce a more efficient light than that obtained in the incandescent lamp, which, though a beautiful invention, is so lacking in the feature of efficiency. As the first step toward this realization I found it necessary to invent some method for transforming economically the ordinary currents as furnished from the lighting circuits into electrical vibrations of great rapidity. The first of these, first disclosed in a lecture at Columbia College in 1891. There exists a popular error in regard to this light, inasmuch as it is believed that it can be obtained without generation of heat. The enthusiasm of Dr. Lodge is probably responsible for this error, which I have pointed out clearly by showing the impossibility of reaching a high vibration without going through the lower or fundamental tones. On purely theoretical grounds such a result is thinkable, but it would imply a device for starting the vibrations of unattainable qualities, inasmuch as it would have to be energized by heat, and other properties of matter. Though I have convictions in this regard, I disavow for the present this proposition as being impossible. We cannot produce light without heat, but we can surely produce a more efficient light than that obtained in the incandescent lamp, which, though a beautiful invention, is so lacking in the feature of efficiency. As the first step toward this realization I found it necessary to invent some method for transforming economically the ordinary currents as furnished from the lighting circuits into electrical vibrations of great rapidity.

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As to the idea of rendering the energy of the sun available for industrial purposes, it fascinated me early, but I must admit it was only long after I discovered the rotating magnetic field that I took a firm hold upon my mind. In assembling the apparatus, and the two possible ways of solving it. Either power was to be developed on the spot by converting the energy of the sun's radiations or the energy of vast reservoirs was to be transmitted economically to any distance. Though there were other possible sources of economical power, only the two solutions, namely, that the line receiving power being obtained without any consumption of material. After long thought I finally arrived at two solutions, but on the first of these, namely, that referring to the development of power in any locality from the sun's radiations, I cannot dwell at present. The system of power transmission, by means of wires, in the form in which I have described it recently, originated in this manner. Starting from the two facts that the earth was a conductor insulated in space and that a body cannot be charged without causing an equivalent amount of electricity in the earth, I undertook to construct a machine which would create as large a displacement as possible of the earth's electricity.

This machine was simply to charge and discharge in rapid succession a body insulated in space, thus altering periodically the amount of electricity in the earth, and causing a pressure all over its surface. It was nothing but what in mechanics is a pump, forcing water from a large reservoir into a small one and back again. Primarily I contemplated only the sending of messages to great distances in this manner, and described the scheme in detail, pointing out the fact that the maintenance of ascertaining certain electrical conditions of the earth. The attractive feature of this plan was that the intensity of the signals should diminish very little with the distance, and, in fact, should not diminish at all, if it were not for the resistance occurring, chiefly in the atmosphere. As all my previous work, this one, too, received the treatment of Marconi, but it forms, nevertheless, the basis of what is now known as "wireless telegraphy."

This statement will bear rigorous examination, but it is not made with the intent of deprecating the work of others. On the contrary, it is with great pleasure that I acknowledge the early work of Dr. Lodge, the brilliant experiments of Marconi, and of a later experimenter in this line, Dr. Slaby of Berlin. Now, this idea I extended to a system of power transmission, and I submitted it to Helmholtz, at the occasion of his visit to this country. He unhesitatingly said that it could certainly be transmitted in this manner, but he doubted that I could ever produce an apparatus capable of creating the high pressures of a number of millions of volts, which is a turning point in the development of the wireless telegraph, and that I could overcome the difficulties of insulation. Impossible! This problem seemed at first, I was fortunate to master it in a comparatively short time, and it was in perfecting this apparatus that I came to a turning point in the development of the wireless telegraph, and that I could overcome the difficulties of insulation. Impossible! This problem seemed at first, I was fortunate to master it in a comparatively short time, and it was in perfecting this apparatus that I came to a turning point in the development of the wireless telegraph, and that I could overcome the difficulties of insulation. Impossible! This problem seemed at first, I was fortunate to master it in a comparatively short time, and it was in perfecting this apparatus that I came to a turning point in the development of the wireless telegraph, and that I could overcome the difficulties of insulation. Impossible! This problem seemed at first, I was fortunate to master it in a comparatively short time, and it was in perfecting this apparatus that I came to a turning point in the development of the wireless telegraph, and that I could overcome the difficulties of insulation. Impossible! This problem seemed at first, I was fortunate to master it in a comparatively short time, and it was in perfecting this apparatus that I came to a turning point in the development of the wireless telegraph, and that I could overcome the difficulties of insulation. Impossible! This problem seemed at first, I was fortunate to master it in a comparatively short time, and it was in perfecting this apparatus that I came to a turning point in the development of the wireless telegraph, and that I could overcome the difficulties of insulation. Impossible! This problem seemed at first, I was fortunate to master it in a comparatively short time, and it was in perfecting this apparatus that I came to a turning point in the development of the wireless telegraph, and that I could overcome the difficulties of insulation. Impossible! This problem seemed at first, I was fortunate to master it in a comparatively short time, and it was in perfecting this apparatus that I came to a turning point in the development of the wireless telegraph, and that I could overcome the difficulties of insulation. Impossible! This problem seemed at first, I was fortunate to master it in a comparatively short time, and it was in perfecting this apparatus that I came to a turning point in the development of the wireless